FIELD METHODS OF ERADICATING WILD CURRANT AND GOOSEBERRY BUSHES

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FOREWORD

Requests from several of the men, employed on blister rust control work, for information regarding various phases of the field work has induced the writer to prepare a paper on crew methods of Ribes eradication. Instead of stating definite rules that could be followed, more or less, in our work, the writer has endeavored to give a broad view of the whole field crew eradication of Ribes, with the hope that many of the suggestions set forth will be of use to the foreman in solving their numerous field problems. All the features of eradication work discussed in this article have been thoroughly tried out in the field, and proved more or less successful.

C O N T E N T S

FIELD METHODS OF ERADICATING RIBES.

There are no hard and fast rules that can be made to govern the choice of eradication methods. The best system to use will, in all cases, depend upon local conditions; namely, the abundance and habit of Ribes growth in that section and the type of territory being worked. In other words, the method should be chosen to fit local conditions.

The two main systems of eradicating Ribes by hand, developed thus far, are the preliminary scouting method and the strip formation. It is possible that experiments now in progress may lead to eradication by chemical means in certain cases.

Preliminary Scouting.

Preliminary scouting is most effective in sections where the Ribes are comparatively few, and grow more or less in patches, or in a territory where only certain types contain Ribes. This scouting system is a prime factor in reducing the cost of eradication, and should be tried out in every area where conditions are favorable. The success of this method will invariably depend on the ability of the scout. No set rules can be applied to scouting. It is a thing that requires natural ability in handling ones self in the woods. A scout must have good judgment, keen eyesight, and must be most conscientious in his work. On his reports will will depend what eradication work is to be done.

The following methods have proved most effective in preliminary scouting for Ribes.

The scout covers the section by running parallel strips every few hundred feet, giving particular attention to those places where Ribes are likely to occur. If only a few bushes are found the scouts pulls these. However, when many scattered Ribes are found more or less abundantly, or patches of Ribes, such as skunk currants, are encountered, he does not try personally to eradicate these. In such cases, the scout marks the trees, by paint or blaze, around the patch, and then arrows a line out to the nearest road, or some other natural feature, as a stream. Here he marks a conspicuous tree in a definite way, as a cross within a circle. Sometimes, instead of marking each Ribes plot by a trail direct to the road, or some natural feature, two or more such areas may be connected by a marked line of trees. On a map of the section covered, the scout shows the approximate location of the areas containing Ribes, the trails to such plots from the roadways, and any connecting lines between plots.

Later, the foreman of the crew, with this map in his possession, takes his men to the nearest Ribes mark shown near a road. Then following the blazed trail, he locates the patch of bushes, and directs the crew to pull them. The crew moved from one plot to another until all the areas

containing Ribes have been covered. If some of the marked plots containing Ribes are large, it is adviseable for the crew to run strips, but usually this will not be necessary.

In order to eliminate blazing a trail from the Ribes patch to the roadway, the following system has been successfully tried out, where only a few patches of Ribes were found. The scout marked the approximate location of the currant or gooseberry plots on his map, and also made a mental picture of their exact location. When the foreman wished to have the Ribes in these areas eradicated, he asked the scout to take the crew to these places. In some cases, it may work well for the foreman and scout to alternate in their duties. During that day, when the scout is conducting the crew to the Ribes plots, he could act as foreman, while the regular foreman could scout other sections.

If a scout knows a territory thoroughly, it may not be necessary for him to run parallel strips on his scout work. In such a case, he would scout effectively the places where he knows Ribes are liable to be found, and only roughly cover the other areas. For instance, in a territory where there are no skunk currants and practically no gooseberries on the dry hardwood ridges, he would confine most of his efforts to scouting the lowlands, along the stream valleys, little runs, and hillside swamps. To check himself, he would occasionally run a strip along the ridge. In all cases, the scout should cover the fence rows and roadways.

Mr. Hodgkins of Massachusetts (using this method) recently scouted over 900 acres at a cost of less than 5 cents per acre. Several checks made by other men failed to show any Ribes missed by Mr. Hodgkins.

Where Ribes are very few and grow more or less in definite places, as in swamps, a method has been tried out where the whole crew scout in line formation with spaces of about fifty to a hundred feet between the men. Here the lineman uses a compass for running his line, and does not mark it in any definite way. The men run a strip across the area to a definite boundary, and then return on the next strip, continuing in this manner until the whole section is covered. If Ribes are found, the lineman mark their lines, and the whole crew closes in and pulls the bushes. As soon as these Ribes are eradicated the line is reestablished, and the crew continue on their strip. This method is not as effective as the other, as it is very difficult to maintain proper spacing and speed when the men are so far apart in line. Usually a crew becomes careless when this system is used. Individual scouting appears to work much more successfully.

Strip Method.

The strip formation is used where the currant and gooseberry bushes are fairly abundant and scattered more or less over all the area being worked. In such places, a systematic covering of the ground is necessary in order to be sure that no Ribes are missed.

The ideal crew is generally considered to consist of five men and a foreman. Some foremen prefer six men in line, but the majority claim they cannot do thorough check behind so many men. The best results are accomplished when the foreman works from twenty to twenty-five feet in back of the line, following a zigzag course, and checking the work of each man. The linemen should be especially checked as they are liable to miss more bushes because of their extra duties. When the foreman finds Ribes behind a man, it is usually best to call his attention to this oversight, rather than for the foreman to pull these bushes. The foreman's chief duty is to supervise the crew, checking the work of the men in line is secondary.

When the strip formation is used, the men line up about ten feet apart. (This distance varies from six to twenty feet according to conditions in the type being worked.) The two end men act as linemen, one following a line of guides or marks while the other is marking a new line. The man who marked the line on the first strip follows it back on the second, while the other lineman marks a new line. In this manner the crew systematically gridiron an area with parallel strips, looking for Ribes on every foot of the ground, the man next to the one following the line should not only be separated the proper distance from his lineman, but should also be one or two feet in back of him, and so with each man down the line. This arrangement will allow each man to see the one next to him, and thus keep his proper distance.

Marking Line.

The amount of territory that a lineman can cover in looking for Ribes, and still run his line, will depend on conditions and the ability of the man. Usually the lineman can only effectively cover half as much ground as the other men in line. If the types being worked are open, he may be able to do three quarters or even a full strip. A good lineman will gage the width of his strip by his ability to keep up with the crew, and still do good work. If he sees he is getting behind the crew, he can gradually close in and do a narrower strip until he has caught up with the line. This may produce a slight wave in the line, but even if this results, it is nothing serious. There will be waves in the line anyway, as it is impossible to run a straight line without a compass. The lineman should, however, endeavor to run as straight a line as possible. He can do this, to a marked degree, if he always places his tag, or other mark, in line with the two previously hung tags on the same strip. Usually the best results are accomplished when the lineman walks on his line, and looks for Ribes only on one side of the line during the entire length of the strip. In running his strip and marking the line, he does not look for Ribes beyond the point where he places his paper, or other mark. Returning on the next strip, the lineman who marked the line follows it back, and looks for Ribes only in the area between his line and the strip of the man next to him. The other men "dress up" on the one who is following the line, being careful to keep the proper spacing.

Most every lineman will have his own definite preference as to the best system of marking the line, naturally depending on the method he has learned and worked with most. If the lineman has difficulty in following the line, keeping up with the crew, and eradicating the bushes on a strip, at least, half as wide as that done by the other men, there is either something wrong with the system used or with the man himself. Most of the line trouble is caused by lack of woods knowledge, a faulty method, or failure to mark the line often enough. No one system of marking appears successful in meeting all conditions. The paper trail (small pieces of paper dropped on the ground) has proven very effective in working types that are, more or less, free from dense undergrowth. This method has the advantage of keeping the lineman's attention on the ground. In a dense brush type, broken branches make an excellent line, provided enough branches are broken so that the line may be followed easily. In types with little or medium undergrowth, pieces of paper 6 x 6", or pieces of cloth, stuck on the brush are effective. Bark blazes also make a good line in such types, however this method should be avoided as many land owners seriously object to the blazing of trees because such wounds give entrance to fungi. In working a brush type containing gray or paper birch, one should avoid using blazes, white paper, or cloth to mark the line, as such marks are difficult to see under the conditions. These markers do not show well against the white bark of the birch, also one will often mistake the sunlight on the trunks for a mark. The paper trail or broken branches would be more effective in such a type.

When pieces of newspaper are used for tags, they can easily be hung on conifers, and made to stay there, if the paper is torn as follows: A slit a few inches long is made in the paper, then another short slit about an inch long is torn at an angle from the first tear. The paper is hung over the branch at the junction of these two slits. The tags should always be hung so the broad face of the tag will be towards the lineman when he returns on the next strip. Any method of marking the line that necessitates picking up the tags, or other markers, is hardly desirable, as it takes added time to do this work, and also diverts too much of the lineman's attention from looking for Ribes.

In pure coniferous growth, kicking up the litter also makes a good line, Hemlock boughs, branches of silver leaf maples, and birches make excellent markers. These branches should always be bent so the light under surface of the leaves will face the lineman as he is coming back on his strip. The lineman should be careful to simply break the lateral or side branches for markers, rather than the main stem. In no case should the top of a pine be bent over as a mark, or blazing be carelessly done so as to injure trees. We are working to save the forests, not to injure them.

When a compass is used to run the line in a territory where Ribes are fairly abundant and scattered, it is also necessary to mark the line in some way, in order to be sure that no ground is skipped. This method then requires a double action of sighting the compass and marking the line,

which most crews have found very troublesome. The use of a compass in running a line is only an advantage when the Ribes are very few and grow more or less in certain definite places, and the men are lined up in scout formation, say twenty feet or more apart. In such work, many feet of territory are not covered by the men on their strips, so that it is not essential that the line be marked and followed closely. Only one compass-man is necessary on a crew, and he should always be on that end of the line towards the area to be worked. A good compassman will not hold up his line to obtain a sight, but will quickly take a sight when the needle swings about even, not waiting until it comesto rest. It is much easier to run north and south, or east and west lines rather than run on some other bearing. In sighting, the compassman should pick out unusual objects, and take long sights whenever possible. When the compassman reaches the end of the strip, he off-sets the width of the crew strip, and then turns back to run another strip parallel with the one just completed. When patches of Ribes are encountered, the compassman and the man on the other end of the line mark their lines, and the whole crew closes in to pull the bushes.

Spacing.

The spacing between the men in line should depend upon two conditions; namely, the abundance and habit of growth of the Ribes, and the density of the undergrowth. In places where the undergrowth is thick, and there are many Ribes, the men should be placed as close as six to eight feet, in order to make sure of getting all the bushes. From this extreme, the spacing may widen to suit conditions. Wide spacing, such as twenty feet or more, should only be used where the bushes are very few and scattered, or grow more or less abundantly only in scattered patches, as mats of skunk currants. There is always a tendency on the part of the men to get too far apart in line, thus causing Ribes to be misses between the individual strips. One of the chief duties of the foreman is to see that proper spacing is being maintained by the men in line. A capable man in the center of the line can greatly aid the foreman in this by helping to regulate the spacing of the men on either side of him.

Speed.

The speed of a crew will also depend upon the abundance of Ribes, and the type of territory being worked. There appears to be a certain medium speed that is most effective in working each type. When the men work too slowly their minds wander, the eyes become dull, and in consequence the men step over the bushes. However, a crew should not go to the other extreme, for in this case many bushes are also missed. A medium speed should be maintained that is sufficiently fast to keep the men alert and active, but slow enough to enable the men to find and pull the bushes. Experience only will teach a foreman the proper speed for each type. The best way for him to ascertain this medium speed is to check behind his crew. If too many Ribes are being missed by the men in line, there is a reason. It can usually be traced to improper spacing or speed. The important thing is to get out the Ribes, covering territory does not mean much unless the eradication work is well done.

More Ribes are missed along fence rows in proportion to the number present than in any other type. This is usually caused by too rapid work, and the fact that the men's attention is liable to be drawn to other things than eradication. Usually the best system of working fence rows is to detail two of the most conscientious men to do this work, while the remainder of the crew are kept on straight eradication under the direction of the foreman. If all the men are placed on the fence rows, it is impossible for the foreman to check all their work. However, if two exceptionally efficient men are detailed to this work, it will only be necessary for the foreman to check their work occasionally. He should, however, insist that these two men cover their work a second time, and change places on the check.

These Ribes in the open are the dangerous ones. Here the wind will strike the bushes, and distribute the spores for considerable distance. Any bushes missed in such places are sure to be seen by the public, and the entire eradication work judged by this example.

Pastures.

The same inefficiency of eradication is often found in pastures as well as fence rows. Because of the open nature of the ground, the men have a tendency to increase their spacing and speed, and in consequence many bushes, even large ones, are missed. Here again are the dangerous bushes, and usually the pastures are growing to young pine, just the trees that will be injured most by the disease. Pastures and all open lands should be worked very carefully, a medium speed maintained, and the spacing such that every foot of the ground can be covered. It is always advisable for the foreman to caution his men about the tendency to miss bushes in such a type, and to be particularly careful in his checking behind the crew. The men should look very carefully around rockpiles, ledges, and patches of brush, as in such places Ribes are often found.

Roadways.

Great care should be exercised in working roadways, as the bushes missed here are exceptionally dangerous in spreading the disease, and sure to be an advertisement of poor work. If the roadside is too wide for one man to cover alone, it may be best to have part of the crew run a strip. In order to make sure of getting all the bushes, the opposite side of the road should also be covered at the same time, even though the inside area is to be, or has been, worked. It is always advisable to do both sides of a road, even when this is a boundary of the eradication area. It is poor policy to throw the pulled Ribes in the roadway, as such bushes look very unsightly. When working roadways, the men come in contact with the public more than in any other type, and should in consequence be exceptionally careful of their actions and work.

Swamps.

There are two main ways of working swamps that have proven effective; the plot system and the strip. The plot method consists of laying out a definite area in the swamp, say fifty to one hundred feet square, marking its boundaries, and then having the men eradicate all the Ribes in this plot. Another area is then marked out, and the men are put to work in the new plot. This oper tion is repeated until the whole swamp is covered. This method is very satisfactory in a brushy swamp where Ribes are abundant.

The strip method is used more in working swamps than the plot system, as usually the Ribes are more or less scattered in such places. With the strip method, the men are lined up about six to eight feet apart, and the linemen take exceptional care to mark their lines well. Parallel strips are run across the swamp until it has been completely covered. In such places particular attention should be given to the speed of the crew, as it is impossible to find the Ribes under the brush if the men go too rapidly. If practical, it is often best to work a swamp during the latter part of the afternoon, as the vegetation in such places is then drier, and the heat is less intense.

Lost Time.

If every man in the crew would regard this work as if he was personally paying for it, there would be very little tendency toward lost time. The most serious evil of lost time is that usually some local person sees this, and a wild story spreads regarding the men "loafing on the job". A few such stories scattered around town, will more than counteract all the good work a crew may do.

The amount of lost time in a crew will depend almost entirely on the foreman. He is responsible for starting work promptly at eight A.M., and seeing that the regulation hours of 8 to 12 and 1 to 5 are strictly maintained. It is part of the foreman's duty to see that the linemen are properly supplied with material for marking the line, and that this is in shape for immediate use in the field. Never should it be necessary to prepare this material in the field, as the men should get an ample supply ready on rainy days. In order to finish a strip, it may occasionally be necessary for a crew to work later than twelve, taking a noon hour after the completion of the strip. In such a case, an inconspicuous place should be selected where the men take their nooning. The people living near the eradication area get a very unfavorable and an erroneous impression of the crew's work, if they see the men taking a nooning at any time except the customary hour of twelve to one.

It has been definitely proved that rest periods are not necessary under normal conditions. The eight hour regulations are based on a day without rest periods. Last year, the crewmen were unanimous in voting an eight hour day without rest periods, rather than a nine or ten hour day with them. Occasionally on a very warm day, or after climbing up a steep hill, it may be advisable to give the crew a five minute rest period. These rest periods ought only to be given under extreme conditions, and when the foreman believes the men can do more efficient work after receiving them.

Ordinarily there are plenty of brooks in the eradication area where the crew can get a drink without leaving their strip. When there is no suitable water, the foreman should designate one of the men to get a canteen or pail filled at the nearest place where good water is obtainable. It makes a very bad impression to see a whole crew leave their work to go after water. While the one member is after water, the rest of the crew continue their eradication work. The foreman ought, if possible, to plan the day's work so the crew will complete the last strip at five o'clock. If the men finish a strip a little before five, it is often best to employ them on checking or working along fence rows until five o'clock, rather than start a new strip. Such discipline as to hours, will greatly improve the morale of the men, and will eliminate criticism on the part of the townspeople.

Lost Motion.

Lost motion in a crew is due to careless, inefficient direction of the work. Efficiency in crew work does not imply "driving the men"; it simply means thoroughness of Ribes eradication, and preventing an excess of wasted effort. The following methods have been successfully tried out to overcome lost motion in the crew work.

When a man found a few Ribes on his strip, instead of holding up the entire crew until he had pulled the bushes, the following two systems were found to be more effective. The one who found the bushes designated those to the foreman, who pulled them, while the crew continued on their strip. In the other method, the man who found the bushes stopped and pulled them, the foreman temporarily taking this man's place in the line. When the man had eradicated the bushes, he checked in back of the crew until he reached the line, then exchanged places with the foreman.

If two men found a few bushes on their strips at about the same time, the other men were directed either to pull the bushes, or to check in back of the line for a short distance. As soon as the first two men had pulled their bushes, the line was re-established, and all the men continued on their strip. If many Ribes were found on one or more of the men's strips, the line-men marked their lines and the whole crew came over to help pull the bushes.

When the man marking the line was unable to keep up with the crew, instead of holding up the work until he reached the line, he simply closed in and did a narrower strip, or even in some cases, came along hurriedly in back of the man next to him in line. This may produce a slight wave to the line, but if it is well marked no serious difficulties will be encountered. (See discussion under heading "Marking Line".)

Checking.

One of the most essential factors in producing good eradication results is the checking of the work performed. By this means, a crew has an opportunity to see exactly what they are accomplishing. It is only by

constant checking that uniformly thorough eradication is assured. Great care should be used by the foreman to make sure the checks are performed in such a way that accurate comparative results can be obtained. The boundaries of the check area should be properly defined, a strict count kept of the kind and number of Ribes found, and the man minutes consumed each time the piece is covered. A record should also be made on the fourth page of BR-1 of the type worked and the acreage covered on the check. If the time consumed on check work is more than fifteen minutes per day per man it should be charged to field investigation and not to eradication. On the fourth page of BR-1 under the heading "times over plot", is designated 1st, 2d, etc. Under 1st should be given the data for the first time the area is worked and not check information. The first time the area is checked the data should be recorded under 2d, etc. Occasionally an infection check should be made to show the per cent of Ribes infected. If the checks are not conscientiously conducted in such a manner, the data obtained is worthless.

Three effective systems of checking the thoroughness of Ribes eradication have been developed, the check strip, the check area, and the advance check plot.

Check Strip.

New York has developed a quarter acre check method, which has been described in a recent news letter, as follows:

The Quarter Acre Check.

1. At any time during the day's work when the crew is eradicating in a type which the foreman wishes to check, he halts his men, has them face about and then takes his position in their rear. They all go forward over ground just worked, collecting the bushes that are pulled but pulling none that are left. The foreman paces the distance and again halts the line when they have covered one-fourth acre.

2. Each man now counts his bushes, examines the leaves hastily for infection, and reports to the foreman who makes a record on page 4, for BR-1.

3. The crew then re-covers the ground, pulling the bushes that were left the first time over. The number is counted and a record made by the foreman in the space provided on form BR-1. If it is desired to make additional checks of the same ground, this operation can be repeated, pulling bushes that were left both ways - making the second and third checks.

For the convenience of those making this check, the following table is given:

TABLE SHOWING NO. OF PACES OF 3 FEET REQUIRED TO COVER 1/4 ACRE, WITH VARIOUS SPACING AND NUMBER OF MEN.

Area	No. of men in line	Spacing of men. (No. of feet apart.)	No. paces (3 ft.)
¼ acre	5	6 ft.	151
¼ "	6	6 "	121
¼ "	7	6 "	101
¼ "	8	6 "	86
¼ "	5	8 "	113
¼ "	6	8 "	91
¼ "	7	8 "	75
¼ "	8	8 "	65
¼ "	5	10 "	91
¼ "	6	10 "	72
¼ "	7	10 "	60
¼ "	.	10 "	51

This table is based on the fact that the two outside men cover only half as much ground as the others. Record of the time required for making the above check must be kept and recorded on BR-1.

When it is desired to check the entire length of a strip, or in a section where many Ribes are encountered, the following method has frequently been used.

Before beginning the strip the foreman decides that this is to be a check strip, and makes sure to obtain the Ribes count up to that point. The crew members, however, are not informed that a check is to be made. When the crew reaches the end of their strip, a record is made of the number and kind of Ribes pulled, and the man minutes consumed. The positions of the men, except the linemen, are then changed, and the crew returns over the same strip, pulling the bushes that were missed. The foreman, following behind the crew, paces the length of the entire strip, and estimating the width of same, he figures the acreage covered. (Length x Breadth ÷ by 43,560 = Acreage) or (A strip 10 chains - 660' by 1 chain - 66' = 1 acre). At the end of the check strip a similar record is made of the number and kind of Ribes pulled, and the man minutes consumed. Occasionally the strip should be covered a third time as a check on the second, and so on, until complete eradication is obtained, with full data recorded for each check. The main fault with this check strip system is the difficulty in telling the exact boundaries of the strip, consequently some bushes may be added or missed on the check.

The following checks were selected from Mr. H. G. Gilbert's BR-1 reports from Newton, N.H.

No. Ribes eradicated				Total Ribes	Percent eradicated each time			
1st	2nd	3rd	4th		1st	2nd	3rd	4th
141	5	2	0	148	95	3½	1½	0
161	3	0		164	98	2	0	0
51	5	1	0	57	89	9	2	0

Check Area

The most accurate method of checking is to re-work a plot of several acres having well defined boundaries, such as streams or roads. It is a good plan to divide the eradication area into such plots and record all data accordingly, so a check area can be selected at any time from among the plots. The crew first completely cover the area according to the method being used, that is strip or preliminary scouting, not knowing that a check is to be made. Then the plot is gone over a second time, however, on this check, close strip formation is used. Instead of changing the position of the men in line during this check, the strips can be run at right angles to those worked the first time (provided the strip method was used the first time). Occasionally the area should be covered the third time, as a check on the second, and so on until complete eradication is obtained. Each time over the area a careful record is kept of the species and total number of Ribes pulled and the time consumed. If the check plot is designated on a map of the territory, by numbers or letters, this should be noted on the BR-1 report, together with the type and estimated acreage. The exact acreage can easily be obtained at the office by planimetering the check plot as shown on the map.

The following check was made last year by a crew at Bethlehem, N. H. under the direction of the writer. The check plot contained a mixed type with medium undergrowth and consisted of about eight acres. The first time over the area the crew pulled 290 gooseberries and 20 skunk currants, the second time two small and one medium size gooseberry, the third and fourth times no Ribes were found.

Advance Check Plot.

The advance plot system of checking is performed entirely by the foreman or supervisor. A sample area of fifty to a hundred feet square is chosen as a check plot; the boundaries marked, but inconspicuously so a crew would not recognize them. Also a record is made of the number and size of the Ribes in the check area, the acreage of the plot, and type. The crew is then sent to eradicate the area, incidently covering the sample plot. After the eradication work is completed in that area, the foreman or supervisor revisits and inspects the sample plot, recording any bushes that have been missed. This method of checking has many advantages. Several small sample plots can quickly and accurately be marked out in any area, only one man's time is required, and absolute comparative results can be obtained, providing the bushes are accurately counted each time.

All the above three systems of checking should be used at different times, and at least one check should be made each day, provided Ribes to any extent are found. The success of our eradication work will depend to a large degree on the frequency and accuracy of this check work.

Removal of Roots.

In pulling the Ribes great care should be used to make sure that all the roots are destroyed, especially all of the crown of the plant. Gooseberries sprout chiefly from the crown. The mattock ought to be used for digging around the bushes, and not for cutting off the roots. All the men in the crew, except the lineman and foreman, should carry light mattocks, which can be used both for spreading apart the brush in searching for Ribes and for grubbing.

Infected Ribes Leaves

Through investigations it has been proved that it is not practical or necessary to strip the infected leaves from Ribes. The leaves soon dry out when the bushes are pulled if the soil is well shaken from the roots, and the bushes are hung up to dry. The spores are destroyed by drought and sunshine. Never should infected, or even non-infected Ribes be hung on a pine.

Recording Field Data.

The foreman should spend considerable effort to produce neat and accurate reports. The BR-1 forms should be made out daily, and promptly sent to the designated places. The foreman ought to keep a field notebook, and in this record a daily itinerary of his work, field observations, and other information that may be of value.

Plan of Day's Work.

Before beginning the day's duties, the foreman should have a definite plan of action worked out. This plan may have to be altered as the day progresses, but a definite outline at the beginning will be of great assistance. The foreman should arrange his work so the men, on their last strip will be working back towards their headquarters.

The practice of some foremen of leaving open areas and fence rows, here and there, to be worked in the future on a wet day has been proved a poor policy. Often these "left areas" are forgotten and dangerous Ribes left in conspicuous places. Usually roadways, fence rows, and the majority of pastures are growing up to brush so the men get actually more wet in such places than in a pine or hardwood stand, where there is often little undergrowth. Ordinarily it is much better to work the territory systematically, and avoid leaving areas to be worked at some future time.

Radius of Vision

It is very difficult to do effective work if one attempts continually to look almost vertically down on the ground for Ribes. If one increases this angle of vision to forty-five or fifty degrees, and thus looks for Ribes ahead of him a distance at least equal to his height, instead of searching for bushes near his feet, he will find more Ribes and will be less tired at night. If a man covers a strip six to ten feet wide on either side of him, he must continually move his head and eyes. When a foreman sees a man going along in a straight line and not moving his head, he can be convinced that the man is not covering his full strip, and that bushes are sure to be missed.

Attitude of Personnel

The eradication work on the white pine blister rust can either be made a pleasant interesting task, or a monotonous dull one, depending upon the attitude of the members of the crew toward their field duties. In order to become interested, the men ought to know the reason for each detail of their work. Each man should have a thorough understanding of the nature and habits of the blister rust, and know what has been done, in a general way, to check its spread. In other words, each man should be able to visualize, or see, his particular part in the whole operation.

The work is not strenuous, but requires endurance, energy, good eyesight, and the ability to concentrate the mind on one thing only, during working hours; namely, the finding and eradicating of currant and gooseberry bushes. Each man ought to regard the work as if he personally was paying for the whole operation, and govern his actions accordingly. There is a great personal satisfaction in a day's work well done.

The field men should be particularly careful of their attitude towards the public. As this is State and Government work, people are ever ready to criticize any small error that may occur. The town people should not be regarded indifferently. These men at least know the woods, realize what a days work is, and are also paying part of your salary. The Townsmen have a right to complain, if things are not being done as they ought to be, and will do so at every opportunity. The crew members, by their good work and actions in towns should make these people our friends and supporters.

Each foreman should endeavor to develop a crew spirit, one that is based on giving both the men and the work a fair deal. A few of the crews have held "get togethers" or smokers where the men discussed their views regarding various subjects, including the blister rust work, and endeavored to improve themselves by the ideas of the others. Any State agent or Federal inspector would be glad to visit the crew at such a time to enlighten the field men on any doubtful points in their work.

Points to Remember

Eight-five percent of the efficiency of a crew depends upon the foreman in charge.

The effectiveness of our eradication work will depend to a great extent upon our attitude towards it.

No standard rules can be made to govern our eradication work. The best method to use is the one that is most effective and cheapest under the conditions.

The Ribes in the open are the dangerous ones in spreading the disease, and are the bushes most often missed.

Most line trouble is due to not marking the line often enough

If bushes are being missed by the men in line it is usually because of improper spacing or speed.

Lost time and motion in a crew are due to a lack of proper supervision by the foreman.

The success of our eradication work will depend to a great extent on the frequency and thoroughness of our checking.

We should aim towards thoroughness of Ribes eradication, rather than covering territory.

The "non-coms" have been called the back bone of the army. In a like respect, the success of our field work will depend, to a great degree on the ability and interest of our foreman and supervisors.